Complete Summary

GUIDELINE TITLE

Quality indicators for colonoscopy.

BIBLIOGRAPHIC SOURCE(S)

Rex DK, Petrini JL, Baron TH, Chak A, Cohen J, Deal SE, Hoffman B, Jacobson BC, Mergener K, Petersen BT, Safdi MA, Faigel DO, Pike IM. Quality indicators for colonoscopy. Gastrointest Endosc 2006 Apr;63(4 Suppl):S16-28. [107 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Colonic disorders, including:

- Diarrhea of unexplained origin
- Iron deficiency anemia
- Colonic neoplasia
- Polyps
- Inflammatory bowel disease
- Colitis
- Crohn's colitis
- Gastrointestinal bleeding
- Acute nontoxic megacolon
- Sigmoid volvulus

GUIDELINE CATEGORY

Diagnosis
Evaluation
Prevention
Screening

CLINICAL SPECIALTY

Gastroenterology

INTENDED USERS

Advanced Practice Nurses
Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

To establish competence in performing colonoscopy and help define areas of continuous quality improvement

TARGET POPULATION

Patients undergoing colonoscopy

INTERVENTIONS AND PRACTICES CONSIDERED

Colonoscopy

MAJOR OUTCOMES CONSIDERED

Safety and efficacy of procedure

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Studies were identified through a computerized search of Medline followed by review of the bibliographies of relevant articles. When such data were absent, indicators were chosen by expert consensus.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Committee)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The American Society for Gastrointestinal Endoscopy (ASGE) and the American College of Gastroenterology (ACG), as leaders in promoting the highest quality patient care, formed a task force to identify end points that could be used to document high-quality endoscopic services. In most cases these end points will require validation before they can be generally adopted. The task force consisted of expert endoscopists selected by the board of directors of the ASGE and the ACG.

The task force developed quality indicators for the 4 major endoscopic procedures: colonoscopy, esophagogastroduodenoscopy (EGD), endoscopic retrograde cholangiopancreatography (ERCP), and endoscopic ultrasonography (EUS). Wherever possible, these indicators were chosen because there were published supporting data. These studies were identified through a computerized search of Medline followed by review of the bibliographies of relevant articles. When such data were absent, indicators were chosen by expert consensus. The goal was to create a comprehensive list of potential quality indicators, recognizing that only a small subset may ultimately be implemented. The resultant quality indicators were graded on the strength of the supporting evidence.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendation

Grade of recommendation	Clarity of benefit	Methodologic strength/supporting evidence	Implications
1A	Clear	Randomized trials without important limitations	Strong recommendation; can be applied to most clinical settings
1B	Clear	Randomized trials with important limitations (inconsistent results, nonfatal methodologic flaws)	Strong recommendation; likely to apply to most practice settings
1C+	Clear	Overwhelming evidence from observational studies	Strong recommendation; can apply to most practice settings in most situations
1C	Clear	Observational studies	Intermediate-strength recommendation; may change when stronger evidence is available
2A	Unclear	Randomized trials without important limitations	Intermediate-strength recommendation; best action may differ depending on circumstances or patients' or societal values
2B	Unclear	Randomized trials with important limitations (inconsistent results, nonfatal methodologic flaws)	Weak recommendation; alternative approaches may be better under some circumstances
2C	Unclear	Observational studies	Very weak recommendation; alternative approaches likely to be better under some circumstances
3	Unclear	Expert opinion only	Weak recommendation; likely to change as data become available

*Adapted from Guyatt G, Sinclair J, Cook D, Jaeschke R, Schunemann H, Pauker S. Moving from evidence to action: grading recommendations—a qualitative approach. In: Guyatt G, Rennie D, eds. Users' guides to the medical literature. Chicago: AMA Press; 2002. p. 599-608.

COST ANALYSIS

Cost-benefit analyses of colonoscopy for the detection of neoplastic lesions are well within acceptable rates (approximately $20,000 per year of life saved).

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The task force consisted of expert endoscopists selected by the board of directors of the American Society for Gastrointestinal Endoscopy (ASGE) and the American College of Gastroenterology (ACG). These documents were then reviewed and approved by the governing boards.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Recommendations were graded on the strength of the supporting evidence (Grades 1A-3). Definitions of the recommendation grades are presented at the end of the "Major Recommendations" field.

Preprocedure

The preprocedure period encompasses the time from first contact by the patient until administration of sedation or instrument insertion. The aspects of patient care addressed in prior documents apply here as well, including timely scheduling, patient preparation, identification, history and physical examination, appropriate choice of sedation and analgesia, evaluation of bleeding risk, etc. Because many examinations are currently being performed for colon cancer screening and are elective, care must be taken to be certain that all potential risks have been reduced to as low as practically achievable.

The American Society for Gastrointestinal Endoscopy (ASGE) and the U.S. Multi-Society Task Force on Colon Cancer have published appropriate indications for colonoscopy (Tables below).

1. Appropriate indication. The ASGE and the U.S. Multi-Society Task Force on Colon Cancer have published appropriate indications for colonoscopy (Tables below). An indication should be documented for each procedure, and when it is a nonstandard indication it should be justified in the documentation. **(1C+)**

   Discussion. In the average-risk population, colonoscopic screening is recommended in all current guidelines at 10-year intervals. Direct observational data to support this interval are lacking. However, in a cohort of average risk persons who underwent an initial colonoscopy with negative results, a repeat colonoscopy 5 years later had a very low yield. Two studies of flexible sigmoidoscopy showed that the protective effect of endoscopy with polypectomy was present for intervals of 10 years and 16 years and could not exclude longer durations of effect. Thus, although colonoscopy is not perfectly protective, its protective effect is prolonged. These data support the continued use of the 10-year interval.

Table: Colonoscopy Indications*

A. Evaluation on barium enema or other imaging study of an abnormality that is likely to be clinically significant, such as a filling defect or stricture
B. Evaluation of unexplained gastrointestinal bleeding
1. Hematochezia
2. Melena after an upper gastrointestinal source has been excluded

3. Presence of fecal occult blood

C. Unexplained iron deficiency anemia
D. Screening and surveillance for colonic neoplasia
    1. Screening of asymptomatic, average-risk patients for colonic neoplasia
    2. Examination to evaluate the entire colon for synchronous cancer or neoplastic polyps in a patient with treatable cancer or neoplastic polyp
    3. Colonoscopy to remove synchronous neoplastic lesions at or around time of curative resection of cancer followed by colonoscopy at 3 years and 3-5 years thereafter to detect metachronous cancer
    4. After adequate clearance of neoplastic polyp(s) survey at 3- to 5-year intervals
    5. Patients with significant family history
        a. Hereditary nonpolyposis colorectal cancer: colonoscopy every 2 years beginning at the earlier of age 25 years or 5 years younger than the earliest age of diagnosis of colorectal cancer. Annual colonoscopy should begin at age 40 years.
        b. Sporadic colorectal cancer before age 60 years: colonoscopy every 5 years beginning at age 10 years earlier than the affected relative or every 3 years if adenoma is found

    6. In patients with ulcerative or Crohn's pancolitis 8 or more years' duration or left-sided colitis 15 or more years' duration every 1-2 years with systematic biopsies to detect dysplasia

E. Chronic inflammatory bowel disease of the colon if more precise diagnosis or determination of the extent of activity of disease will influence immediate management
F. Clinically significant diarrhea of unexplained origin
G. Intraoperative identification of a lesion not apparent at surgery (e.g., polypectomy site, location of a bleeding site)
H. Treatment of bleeding from such lesions as vascular malformation, ulceration, neoplasia, and polypectomy site (e.g., electrocoagulation, heater probe, laser or injection therapy)
I. Foreign body removal
J. Excision of colonic polyp
K. Decompression of acute nontoxic megacolon or sigmoid volvulus
L. Balloon dilation of stenotic lesions (e.g., anastomotic strictures)
M. Palliative treatment of stenosing or bleeding neoplasms (e.g., laser, electrocoagulation, stenting)
N. Marking a neoplasm for localization

American Society for Gastrointestinal Endoscopy. Appropriate use of gastrointestinal endoscopy. Gastrointest Endosc 2000;52:831-7.

Table 3: Indications for Colonoscopy and Appropriate Intervals*

Indication	Interval*
Bleeding	
Positive FOBT	NR

Indication	Interval*
Hematochezia	NR
Iron deficiency anemia	NR
Melena with negative esophagogastroduodenoscopy	NR
Screening	
Average risk	10 y (begin at age 50 y)
Single FDR with cancer (or adenomas) at age ≥ 60 y	10 y (begin at age 40 y)
≥2 FDRs with cancer (or adenomas) or 1 FDR diagnosed at age <60 y	5 y (begin at age 40 y or 10 y younger, whichever is earlier)
Prior endometrial or ovarian cancer diagnosed at age <50 y	5 y
HNPCC (begin age 20-25 y)	1-2 y
Abdominal pain, altered bowel habit#	
Positive sigmoidoscopy (large polyp or polyp of <1 cm shown to be an adenoma)^	
Postadenoma resection	
1-2 tubular adenomas of <1 cm	5-10 y
3-10 adenomas or adenoma with villous features, ≥1 cm or with HGD	3 y
>10 adenomas	<3 y
Sessile adenoma of ≥2 cm, removed piecemeal**	2-6 m
Postcancer resection	Clear colon, then 1 y, then 3 y, then 5 y
Ulcerative colitis, Crohn's colitis surveillance after 8 y of pancolitis or 15 y of left-sided colitis	2-3 y until 20 y after onset of symptoms, then 1 y

FOBT, Fecal occult blood test; NR, interval not recommended; FDR, first-degree relative; HNPCC, hereditary nonpolyposis colorectal cancer; HGD, high-grade dysplasia.

*From: Rex DK, Bond JH, Winawer S, et al. Quality in the technical performance of colonoscopy and the continuous quality improvement process for colonoscopy: recommendations of the U.S. Multi-Society Task Force on Colorectal Cancer. Am J Gastroenterol 2002;97:1296-308. Updated based on guideline revisions in press. Used with permission.

#If colonoscopy has negative results and symptoms are stable, repeat examination should be done according to screening recommendations.

^See postadenoma resection recommendation.

**The goal is to reexamine the site for residual polyp; repeating a flexible sigmoidoscopy is adequate for a distal polyp.

2. Informed consent is obtained, including specific discussions of risks associated with colonoscopy. **(3)**

   Discussion. As with all other endoscopic procedures, consent must be obtained before the procedure from the patient or guardian on the same day (or as required by local law or per policy of the institution) as the procedure.

Consent may be obtained in the procedure room. It must include a discussion of the risks, benefits, and alternatives to the procedure.

3. Use of recommended postpolypectomy and postcancer resection surveillance intervals (Tables above). **(1A)**

   Discussion. For colonoscopy to be both effective and cost-effective and to minimize risk, the intervals between examinations should be optimized. Intervals between examinations can only be effective in prevention of incident colorectal cancer when the colon is effectively cleared of neoplasia. Therefore, detailed and effective examination of the colon, as discussed below, is critical to the effectiveness of recommended intervals between colonoscopies. The recommended intervals assume cecal intubation, adequate bowel preparation, and careful examination.

   Colonoscopy, even when performed carefully, is not expected to prevent all incident colorectal cancers. Some colorectal cancers arise because of genetic factors that make the adenoma-to-carcinoma sequence faster. In addition, in some instances, colonoscopic polypectomy may not be effective in eradicating polyps. Because colonoscopy can be an expensive procedure and is associated with a low risk of serious consequences, intervals between examinations are recommended on the basis of the best available evidence and experience that indicates a balance between the protective effect of high-quality clearing colonoscopy with the risks and cost of colonoscopy.

   Recent evidence from 4 surveys indicated that postpolypectomy surveillance colonoscopy in the United States is frequently performed at intervals that are shorter than those recommended in guidelines. These surveys underscore the importance of measuring intervals between examinations in continuous quality improvement programs. Some endoscopists in these studies performed colonoscopy in patients with only small hyperplastic polyps or a single tubular adenoma at 1 year, an interval abandoned in guidelines after publication of the National Polyp Study randomized trial in 1993. Surgeons were more likely than gastroenterologists to use short intervals. These data underscore the need for endoscopic leaders to promote continuous quality improvement among all specialties practicing colonoscopy in a given community.

   Diminutive hyperplastic polyps, when found only in the rectosigmoid colon, can be considered normal. The presence of small distal hyperplastic polyps only should not alter the recommended interval for surveillance. Appropriate intervals in patients with large hyperplastic polyps located in the proximal colon, or in patients who have many hyperplastic polyps (30 or more) are not yet established, but close follow-up may be appropriate.

   Patients who have evidence of colonic bleeding that occurs after a colonoscopy with negative results may need repeat examinations at intervals shorter than those recommended in the Tables above. However, the use of fecal occult blood testing for the first 5 years after a colonoscopy is discouraged because the positive predictive value of guaiac-based fecal occult blood testing during that interval is extremely low. Additional study of fecal

immunochemical testing for blood in this setting as an adjunct to colonoscopy is warranted.

4. The use of recommended ulcerative colitis and Crohn's colitis surveillance. **(2C)**

   Discussion. In ulcerative colitis and Crohn's colitis, surveillance refers to interval examinations of patients with long-standing disease who have undergone an initial examination in which dysplasia is not detected. The term is also used when patients who are asymptomatic are prospectively entered into interval colonoscopy programs on the basis of their duration of disease. Surveillance does not refer to diagnostic examinations or examinations in previously diagnosed patients to assess symptoms. Both ulcerative colitis and Crohn's colitis of long duration are associated with an increased risk of colorectal cancer. There are no randomized trials to support the effectiveness of surveillance colonoscopy in ulcerative colitis or Crohn's colitis, but case control studies in ulcerative colitis suggest a survival benefit for patients who participate in surveillance. Surveys of practitioners in the United States and the United Kingdom demonstrate that many practitioners are not familiar with surveillance recommendations, have a poor understanding of dysplasia, and make inappropriate recommendations in response to findings of dysplasia.

   Patients should be encouraged to undergo surveillance colonoscopy, and surveillance has emerged as a standard of medical care in the United States. The onset of disease is timed to the onset of symptoms for the purpose of timing the initiation of surveillance in both ulcerative colitis and Crohn's colitis. Because the yield of ulcerative colitis in surveillance for cancer and severe dysplasia is relatively low, it is important to not overuse surveillance colonoscopy during the first 20 years because overuse is not cost-effective. Shorter intervals between examinations are indicated for patients with long-duration disease and may be initiated earlier in the course of disease in patients with established risk modifiers, such as a family history of colorectal cancer or a personal history of primary sclerosing cholangitis. Persons with primary sclerosing cholangitis who are discovered to have asymptomatic ulcerative colitis should begin surveillance at the time ulcerative colitis is diagnosed.

5. Preparation: in every case the procedure note should document the quality of preparation. **(2C)**

   Discussion. In each colonoscopy, the colonoscopist should document the quality of the bowel preparation. In clinical trials of bowel preparation, terms used to commonly characterize bowel preparation include "excellent," "good," "fair," and "poor." In clinical practice, these terms do not have standardized definitions. In clinical trials on the effectiveness of various laxative regimens for bowel preparation, excellent is typically defined as no or minimal solid stool and only small amounts of clear fluid requiring suctioning. "Good" is typically no or minimal solid stool with large amounts of clear fluid requiring suctioning. "Fair" refers to collections of semisolid debris that are cleared with difficulty. "Poor" refers to solid or semisolid debris that cannot be effectively cleared. These terms can be interpreted as having more to do with retained intraluminal contents that often can be removed by suctioning rather than the

quality of inspection allowed after suctionable material has been fully removed; however, these terms are probably reasonable guides to the appropriate use of bowel descriptors.

Poor bowel preparation is a major impediment to the effectiveness of colonoscopy. Poor preparation prolongs cecal intubation time and withdrawal time and reduces detection of both small2 and large2 polyps. In every colonoscopic practice, some colonoscopies must be repeated at intervals shorter than those recommended in Table 3 because of inadequate preparation. The task force recommends that the procedure be considered adequate if it allows (within the technical limitations of the procedure) detection of polyps 5 mm or larger. The economic burden of repeating examinations because of inadequate bowel preparation is substantial. No thresholds are recommended by the committee for the percentage of examinations that are repeated for poor preparation because the percentage of patients requiring repeat examination may depend mostly on patient population characteristics. However, measurement of individual practitioners' percentage of examinations requiring repeat because of preparation is recommended. Individual endoscopists may compare their percentages to others within the same practice or to other endoscopists practicing in the same hospital. This can allow identification of outliers within that hospital for whom corrective measures should be taken.

Intraprocedure

Quality evaluation of the colon consists of intubation of the entire colon and a detailed mucosal inspection. Cecal intubation improves sensitivity and reduces costs by eliminating the need for radiographic procedures or repeat colonoscopy to complete examination. Careful mucosal inspection is essential to effective colorectal cancer prevention and reduction of cancer mortality. The detection of neoplastic lesions is the primary goal of most colonoscopic examinations.

Cost-benefit analyses of colonoscopy for the detection of neoplastic lesions are well within acceptable rates (approximately $20,000 per year of life saved). However, complications, repeat procedures, and inappropriate surgical intervention for endoscopically removable polyps can significantly reduce this benefit. It is incumbent on endoscopists to evaluate their practices and seek to make improvements wherever possible to reduce the costs associated with neoplasia detection.

6. Cecal intubation rates: visualization of the cecum by notation of landmarks, and photodocumentation of landmarks should be documented in every procedure. **(1C)**

   Discussion. Cecal intubation should be documented by naming the identified cecal landmarks. Most important, these include the appendiceal orifice and the ileocecal valve. In cases where there is uncertainty as to whether the cecum has been entered, visualization of the lips of the ileocecal valve (i.e., the orifice) or intubation of the terminal ileum will be needed. Experienced colonoscopists can verify cecal intubation in real time in 100% of cases, because there is no other portion of the gastrointestinal tract with a similar

appearance. It can be helpful to document other landmarks, such as the cecal sling fold or intubation of the terminal ileum.

Photography of the cecum is also recommended. Still photography of the cecum may not be convincing in all cases because of variations in cecal anatomy. Thus, the ileocecal valve may not be notched or may not have a lipomatous appearance; however, still photography is convincing in a substantial majority of cases, and its use allows verification of cecal intubation rates of individual endoscopists in the continuous quality improvement program. The best photographs of the cecum to prove intubation are of the appendiceal orifice, taken from a distance sufficiently far away that the cecal strap fold is visible around the appendix, and a photograph of the cecum taken from distal to the ileocecal valve. Photographs of the terminal ileum are sometimes convincing if they show villi, circular valvulae connivente, and lymphoid hyperplasia, but they are less likely to be effective compared with the above-mentioned photographs. Videotaping of the cecum is not necessary in clinical practice because its feasibility remains low at this time; however, the appearance of the cecum is unmistakable in real time and videotaping of the cecum can be a very effective way of documenting cecal intubation for an examiner whose rates of cecal intubation require verification.

Effective colonoscopists should be able to intubate the cecum in $\geq$90% of all cases and in $\geq$95% of cases when the indication is screening in a healthy adult. All colonoscopy studies done for screening have reported cecal intubation rates of 97% or higher. Cases in which procedures are aborted because of poor preparation or severe colitis need not be counted in determining cecal intubation rates. It is also not necessary to count cases in which the initial intent of the procedure is colonoscopic treatment of a benign or malignant stricture or a large polyp (provided that complete colonic imaging by some method has been previously performed). All other colonoscopies, including those in which a previously unknown benign or malignant stricture is encountered, should be counted.

7. Detection of adenomas in asymptomatic individuals (screening). **(1C)**

   Discussion. Among healthy asymptomatic patients undergoing screening colonoscopy, adenomas should be detected in $\geq$25% of men and $\geq$15% women more than 50 years old.

8. Withdrawal times: studies have demonstrated increased detection of significant neoplastic lesions in colonoscopic examinations where the withdrawal time is 6 minutes or more. Mean withdrawal time should be $\geq$6 minutes in colonoscopies with normal results performed in patients with intact colons. **(2C)**

   Discussion. In instances of low detection rates of adenomas, measurement of withdrawal time is appropriate as a quality indicator. To measure withdrawal time, the time at which the cecum is reached and the time at which the scope is withdrawn from the anus must be noted. Some electronic report-generating systems allow the time to be noted electronically when cecal photographs are taken. On the basis of the mean withdrawal times of an examiner with very

low miss rates5 and previously cited evidence that the detection rate of large adenomas was greater for examiners who took longer than 6 minutes for withdrawal during screening colonoscopy, it is recommended that the withdrawal phase of colonoscopy in patients without previous surgical resection should last at least 6 minutes on average. Application of this standard to an individual case is not appropriate because colons differ in length and in some instances a very well prepared colon of relatively short length and with nonprominent haustral markings can be carefully examined in less than 6 minutes. Further, recent evidence suggests that colonoscopies with a wide angle of view allow quicker examination without increasing miss rates for polyps.

9. Biopsy specimens should be obtained from the colon in patients with chronic diarrhea. **(2C)**

   Discussion. Patients with microscopic colitis (collagenous and lymphocytic colitis) may have normal-appearing mucosa at colonoscopy. The diagnosis requires biopsy of otherwise unremarkable-appearing colon. All patients undergoing colonoscopy for the evaluation of chronic diarrhea should have biopsy specimens obtained. The optimal number and location of biopsy specimens is not established. Inclusion of samples from the proximal colon improves the sensitivity for collagenous colitis.

10. Number and distribution of biopsy samples in ulcerative colitis and Crohn's colitis surveillance. Goal: 4 per 10-cm section of involved colon or approximately 32 biopsy specimens in cases of panulcerative colitis. **(1C)**

    Discussion. Systematic biopsy of the colon and terminal ileum can assist in establishing the extent of ulcerative colitis and Crohn's disease and in differentiating ulcerative colitis from Crohn's disease. During surveillance, a systematic biopsy protocol is needed to maximize the sensitivity of surveillance for dysplasia. The recommended protocol includes biopsies in all 4 quadrants from each 10 cm of the colon. This typically results in 28 to 32 biopsy samples as a minimum. The procedure report in ulcerative colitis surveillance examinations should note the number and locations of specimens from flat mucosa and the location and endoscopic appearance of any mass or suspicious polypoid lesions that were sampled or removed.

11. Mucosally based pedunculated polyps and sessile polyps <2 cm in size should not be sent for surgical resection without an attempt at endoscopic resection or documentation of endoscopic inaccessibility. **(3)**

    Discussion. Patients with sessile polyps <2 cm in size should seldom be referred for surgical resection because these polyps are readily resectable in most cases by competent colonoscopists. Consistent referral of sessile polyps <2 cm in size for surgical resection is inappropriate. In some cases, these polyps may be difficult to access or properly position for polypectomy, and referral to a more experienced endoscopist may be appropriate.

    Certainly endoscopists should not attempt removal of polyps they consider beyond their skill or comfort level, and they should feel comfortable in referring such polyps to other endoscopists for a second opinion (e.g., review

of photographs) or endoscopic resection. Many sessile polyps >2 cm in size are also removable endoscopically, depending on their location within the colon, their size, and the ability to access them endoscopically. Essentially all mucosally based pedunculated polyps can be removed endoscopically. All polyps referred for surgical resection should be photographed to document the need for surgical resection in the continuous quality improvement process. Review of photographs by a second, more experienced endoscopist can be useful to ensure the appropriateness of surgical referral. When surgical referral is pursued, correlation of photographs and endoscopic and pathologic measurements of polyp size should be undertaken to confirm the appropriateness of surgical referral.

Postprocedure

The aspects of postprocedure care that have been discussed in previous sections also apply here. A complete and accurate report, describing the procedure and findings, must be completed immediately after the procedure. The report should include photo documentation of abnormalities and identification of any biopsy specimens obtained. Expectations for follow-up care and determination of who will provide the follow-up should be specified.

The postprocedure interval also provides an opportunity to determine the safety of the procedure as performed by any given endoscopist. Although some complications are discovered immediately, each practitioner should establish a system to contact patients after a period of time to determine whether any delayed complications have occurred. Methods to report and evaluate these complications should be in place so that systematic errors can be discovered and corrected.

12. Incidence of perforation by procedure type (all indications vs screening) is measured. **(2C)**

    Discussion. Perforation is the most serious complication in the short term during or after colonoscopy. About 5% of colonoscopic perforations are fatal. Considering all the available data, perforation rates greater than 1 in 500 overall or greater than 1 in 1,000 in screening patients should raise concerns as to whether inappropriate practices are the cause of the perforations.

    Perforations are of two general types. Diagnostic perforations occur as a result of insertion of the colonoscope. They are most commonly mechanical and caused by rupture of the side of the instrument through the rectosigmoid region. They typically result in large rents in the colon that may be recognized during the procedure. Mechanical perforations can also result from barotraumas. Barotrauma perforations are the result of pneumatic pressures in the cecum that exceed its bursting pressure. They are most likely to occur when the colonoscope has passed either a stricture or severe diverticular disease and the patient has an ileocecal valve that is competent to air. Barotrauma perforations can probably be avoided in most cases by judicious use of air during insufflation, particularly after passing strictures, perhaps by insufflation of carbon dioxide rather than air, and by ensuring that the air pump and the light source will not continue to insufflate air when intraluminal

pressures exceed the bursting pressure of the colon. Mechanical perforations can also occur during attempts to pass benign or malignant strictures.

Perforations may also result from polypectomy. In virtually every case, they are the result of the electrocautery burn. The risk of perforation is greatest with large polyps in the proximal colon. Submucosal saline solution injection polypectomy is now frequently used by gastroenterologists, although no standardized guidelines regarding the size and location of polyps that require submucosal saline solution injection have been developed. In experimental models, injection reduces the chance of electrocautery damage to the muscularis propria, but no randomized controlled clinical trial has been performed that demonstrates reduction of risk of perforation or postpolypectomy syndrome by injection. Therefore, colonoscopists should be familiar with and comfortable with the technique of submucosal saline solution injection, but clinical judgment is necessary in determining which polyps should undergo submucosal injection.

Anecdotal reports have suggested an increased risk of complications associated with the use of hot biopsy forceps, and forceps removal of small polyps reduces the chance of complete removal. Cold snaring is attractive for the removal of small polyps because it effectively removes small polyps and has been associated with exceedingly low risks of complications. Cold snaring often results in immediate bleeding that is of no clinical significance and allows effective retrieval of polyps.

13. Incidence of postpolypectomy bleeding is measured. **(2C)**

Bleeding is the most common complication of polypectomy. Bleeding can be either immediate (during the procedure) or delayed. In general, the use of blended or cutting current is associated with an increased risk of immediate bleeding, whereas pure low-power coagulation is associated with a greater risk of delayed bleeding. In clinical practice, the use of pure low-power coagulation or blended current is common, and the use of pure cutting current for polypectomy is rare.

Endoscopic series suggests that the overall risk for postpolypectomy bleeding should be less than 1%. Overall, bleeding rates for polypectomy that exceed this rate should prompt review by experts from within or outside the institution regarding whether polypectomy practices are appropriate. In general, the risk of bleeding increases with the size of the polyps and with a more proximal colonic location. For polyps larger than 2 cm, particularly in the proximal colon, bleeding rates may exceed 10%.

Inclusion of epinephrine in submucosal injection fluid has been shown to reduce the risk of immediate bleeding but not delayed bleeding. Because the overall risk of immediate bleeding with pure low-power coagulation current is low and immediate bleeding can generally be treated successfully by experienced endoscopists, there is no mandate to include epinephrine in injection fluid. Many experts prefer pretreatment of pedunculated polyps with thick stalks by epinephrine injection or placement of detachable snares. Two trials have demonstrated benefit from the use of detachable snares. However, the clinical benefit may be marginally significant, and therefore the use of

detachable snares in clinical practice for pedunculated polyps is not mandated.

14. Postpolypectomy bleeding should be managed nonoperatively. In the presence of continuous bleeding, repeat colon examination and endoscopic treatment of polypectomy sites results in successful hemostasis. **(1C)**

    Discussion. In general, >90% of postpolypectomy bleeding can be managed nonoperatively. Immediate postpolypectomy bleeding can generally be treated effectively by endoscopic means and should seldom require operative treatment. After transection, immediate bleeding from the stalk of the pedunculated polyp can be treated by regrasping the stalk and holding it for 10 to 15 minutes. This causes spasm in the bleeding artery. Immediate bleeding can also be treated by application of clips or by injection of epinephrine, followed by application of multipolar cautery.

    Delayed bleeding frequently stops spontaneously. In-hospital observation may be appropriate if the patient has comorbidities or lives far from the treating physician. Repeat colonoscopy in patients who have stopped bleeding is optional and should be performed at the discretion of the colonoscopist. Patients seen for delayed bleeding who are continuing to pass bright red blood are usually having an arterial hemorrhage. Prompt repeat colonoscopy, which may be performed without bowel preparation, is warranted. Treatment can be either by application of clips or by injection in combination with multipolar cautery. Multipolar cautery is generally applied at low power, without forceful tamponade (especially in the proximal colon), and continued until there is subjective cessation of bleeding. Findings in the base of the bleeding polypectomy site can include an actively bleeding visible vessel, a nonbleeding visible vessel, an apparent clot without bleeding, or an apparent clot with bleeding. Rebleeding seldom occurs after postpolypectomy bleeding has either stopped spontaneously or from endoscopic therapy.

Definitions:

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CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

A high quality endoscopy ensures that the patient receives an indicated procedure, that correct and clinically relevant diagnoses are made (or excluded), that therapy is properly performed, and that all these are accomplished with minimal risk.

POTENTIAL HARMS

The risks of endoscopy include bleeding, perforation, infection, sedation adverse events, missed diagnosis, missed lesions, and intravenous site complications.

QUALIFYING STATEMENTS

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- Underlying this discussion of quality indicators is the assumption that adequate training and credentialing has taken place before a practitioner begins the practice of endoscopy. The American Society for Gastrointestinal Endoscopy (ASGE) has guidelines specifically addressing standards for training, assessing competence, and granting privileges to perform endoscopy. It is the task force's recommendation that these guidelines be adopted by facilities where endoscopic procedures are performed.
- The list of potential quality indicators was meant to be a comprehensive listing of measurable endpoints. It is not the intention of the task force that all end points be measured in every practice setting. In most cases, validation may be required before a given end point may be universally adopted.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Rex DK, Petrini JL, Baron TH, Chak A, Cohen J, Deal SE, Hoffman B, Jacobson BC, Mergener K, Petersen BT, Safdi MA, Faigel DO, Pike IM. Quality indicators for colonoscopy. Gastrointest Endosc 2006 Apr;63(4 Suppl):S16-28. [107 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2006 Apr

GUIDELINE DEVELOPER(S)

American College of Gastroenterology - Medical Specialty Society
American Society for Gastrointestinal Endoscopy - Medical Specialty Society

SOURCE(S) OF FUNDING

American Society for Gastrointestinal Endoscopy

GUIDELINE COMMITTEE

ASGE/ACG Taskforce on Quality in Endoscopy

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American Society for Gastrointestinal Endoscopy Web site.

Print copies: Available from the American Society for Gastrointestinal Endoscopy, 1520 Kensington Road, Suite 202, Oak Brook, IL 60523

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Bjorkman, DJ, Popp, JW. Measuring the quality of endoscopy. Gastrointest Endosc 2006 Apr;63(4 Suppl):S1-2. Available in Portable Document Format (PDF) from the American Society for Gastrointestinal Endoscopy Web site.

- Faigel, DO, Pike, IM, Baron, TH, Chak, A, Cohen, J, Deal, SE, Hoffman, B, Jacobson, BC, Mergener, K, Petersen, BT, Petrini, JL, Rex, DK, Safdi, MA. Quality indicators for gastrointestinal endoscopic procedures: an introduction. Gastrointest Endosc 2006 Apr;63(4 Suppl):S3-9. Available from the American Society for Gastrointestinal Endoscopy Web site.

Print copies: Available from the American Society for Gastrointestinal Endoscopy, 1520 Kensington Road, Suite 202, Oak Brook, IL 60523

PATIENT RESOURCES

None available

NGC STATUS

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